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ABSTRACT

This booklet is intended to enable the beginner in the field of transformational grammar to read and gain information about much of the contemporary scholarly literature on grammar (of foreign languages as well as of English). Sections in the book discuss phrase structure grammar; transformational rules--movement rules, insertion rules, substitution rules, and deletion rules; the advantages of understanding transformational grammar; and phonology. (JM)

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A Primer of

TRANSFORMATIONAL GRAMMAR

For Rank Beginners

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Suzette Haden Elgin

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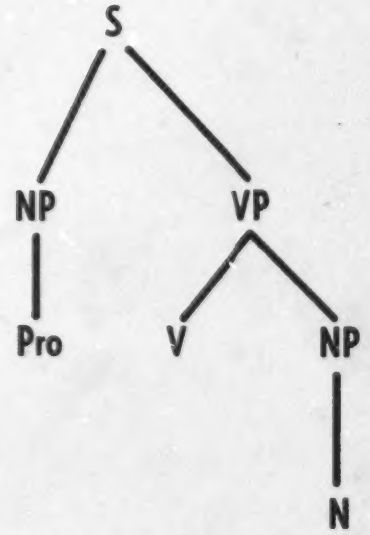

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INTRODUCTION

This small book is intended, as the title indicates, for the *real* beginner in the field of transformational grammar. It's not intended for the graduate student in linguistics who is working under the direction of a faculty of experts, and it's therefore very unlike the so-called "introductions" to the field available from commercial publishers. I don't mean to put down those books, having been personally guilty of writing or partly writing a couple of them myself. They have a certain task to do, and they do it reasonably well. But the individual like yourself, who is not a linguist and has no intention of becoming a linguist, and who has no transformational grammarian handy to explain things, might as well have no book at all as these pseudo-introductions.

This book is really for beginners. It is intended to make it possible for you to go on and read the introductions, if that happens to appeal to you. It's intended to make it possible for you to read much of the contemporary scholarly literature on grammar (of foreign languages as well as of English), not with the goal of truly understanding the theoretical depths of the articles but rather with the goal of gaining information that may be of use to you in your professional life.

Some of the literature you read will talk about transformational grammar, and some will use the term "generative" grammar. Yet another batch of writing will talk of "transformational-generative" grammar. In the interests of clarity, let's get this terminological hassle out of the way first. There are many types of generative grammars, and the term "generative" merely means that they are grammars which will generate sequences of language. A transformational grammar is just one kind of generative grammar, one of many possible kinds. Most linguists working in syntax use either the term "transformational grammar" or "transformational-generative grammar," while the phonologists (those working with the sound systems of languages) tend to speak of "generative grammar." The terms are not *technically* interchangeable, not in a high-powered theoretical sense, but in practical usage they are treated as if they were. We will therefore, for the duration of this discussion, arbitrarily settle on the term "transformational grammar," and will abbreviate it as "T-grammar" for convenience.

Now let's get on with it. The first thing to be discussed is . . .

THE PHRASE STRUCTURE GRAMMAR

Phrase structure grammars are currently looked upon as a bit old-fashioned by some linguists, but they remain a practical tool for the teacher and are a substantial part of the available literature, so they cannot be ignored.

Think of your head as containing something you want to say. The form, the actual shape, of this something-you-want-to-say, is a mystery to us all. Think of it as a kind of free-form lump of meaning, with pieces floating about in it.

Now to get this free-form into shape so that it can be expressed, it must be assigned some kind of structure that can be pronounced or written. The first step in assigning such a structure is the set of rules known as phrase structure grammar (PSG) rules.

The PSG has two specific functions to fulfill. First, it must indicate what chunks can be combined in a given language to form constituents of one or more such chunks. For example, if a native speaker of English is asked to look at sentence no. 1 below and make some kind of logical division of that sentence into parts, he or she will come up with something like the arrangement in no. 2. Every speaker of English, including the most linguistically unsophisticated, will reject no. 3 as a possible division.

1. The elephant kicked over the lantern.
2. the/elephant
   the elephant/kicked over
   kicked over/the lantern
   the/lantern
   the elephant/kicked over the lantern
3. the elephant kicked
   elephant kicked over the/lantern
   the/elephant kicked

That is, the native speaker has some kind of intuitive feeling that "the elephant" is a constituent, and that the individual words are constituents, and that "kicked over the lantern" is a constituent. He has no such feeling about possible combinations like "kicked over the" or "elephant kicked."

The second function of the PSG is to tell us in what basic order the constituents are to be arranged. Native speakers of English will accept no. 4 below, but not any of the other examples.

4. The elephant went stumbling through the shrubbery.
5. Stumbling elephant the through the shrubbery went.
6. Through stumbling elephant the shrubbery the went.
7. The shrubbery went through stumbling the elephant.

It is customary in T-grammar literature to put an asterisk in front of sentences that would not be considered grammatical by native speakers, so that sentences 5-7 would ordinarily appear like sentence no. 8.

8. *Boy the fell down.

At this point, having explained the two functions of the PSG, it's time for me to bring in the actual rules. They look a good deal like math, which causes those of us with mental prejudice blocks about math to react in a thoroughly irrational manner to the very sight of them. Try to suppress this reaction, because it will only get in your way and has no logical justification. Here we go.

S ⟶ NP VP
NP ⟶ (Det) N
VP ⟶ V (NP)

This is a partial set of PSG rules for English. The first one tells us that a S(entence) is composed of a N(oun) P(hrase) and a V(erb) P(hrase), in that order. The second rule says that a N(oun) P(hrase)–an NP–is composed of a N(oun), which may be preceded by a Det(erminer). The parentheses around an element indicate that it is optional. The third rule says that a V(erb) P(hrase)–a VP) is composed of a V(erb), which may optionally be followed by an NP.

This set of rules will permit all of the sequences in Examples 9-12 below, but will not allow any of the sequences in 13-16.

9. Jason screamed.
10. The boy left.
11. The girl drank a milkshake.
12. Some boys saw Elizabeth.
13. *Screamed Jason.
14. *Boy the left.
15. *Milkshake a drank girl the.
16. *Boys some Elizabeth saw.

The set of rules is only a partial set because there are a number of other elements that may occur as NP, and there may be other elements within the VP. In addition, some provision has to be made in these rules for negative elements, interrogative elements, and so on. For example, a possible modification of the first rule to allow for these latter elements would be the following:

S ⟶ SA (NEG) NP VP
SA ⟶ { Dec, Q, Imp }
NEG ⟶ not

This modification tells us that a sentence is composed of a S(peech) A(ct) followed optionally by NEG(ative), and then NP and VP. Further, it tells us that SA is composed of one of the following: Dec(larative), Q(uestion), or Imp(erative). The marks around this group—called "curly brackets" or "curly braces"—indicate that you must choose one and only one of the set. And finally, the rules tell us that NEG(ative) is composed of "not."

This is only one possible way of indicating the presence of such elements. There are a number of others. What is important is that you realize that the various proposed ways of setting down this information—called "formalisms"—are only variations of one another. Choosing among them is a matter for professional linguists, based on theoretical and methodological considerations. It is *not* a matter for your concern, since one system is in practical terms equivalent to another. We will therefore look at only one other example, just to get an idea of the scope of possible variation.

S ⟶ Mod Prop

Mod ⟶ { Dec, Q, Imp } (NEG)

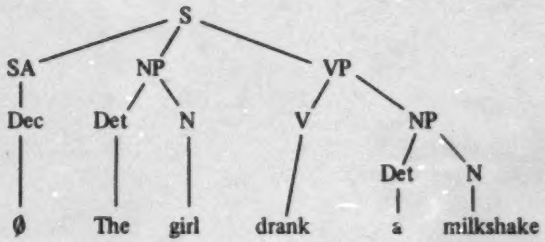
NEG ⟶ not

Prop ⟶ NP VP

In this system the elements like Imperative and Negative are separated from the NP and VP and called Mod(ality) elements. The NP and VP are then referred to as the Prop(osition). The proposition is seen as including the basic factual information, while other things, such as the speaker's intentions and opinions, are included in the modality.

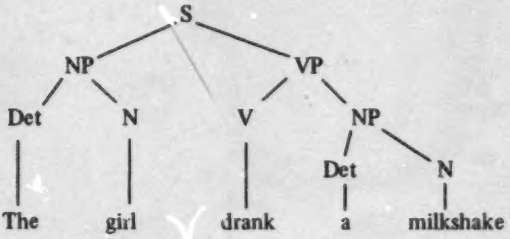
Both of these systems, however, and their numerous variations will generate the same kinds of sequences of language. It is unfortunate, and a hurdle to the beginner, for linguists not to be able to agree on the system of symbols they want to use. As a linguist, I apologize for this additional source of confusion. It is the inevitable result of many factors, and the most heavily responsible is probably the newness of the field. What is really important, however, and what you should remember, is that *no* system of PSG rules proposed for English suggests that determiners follow nouns, *or* that there is no such element as NEG, *or* that a sequence like "boy saw the" is a constituent of English. Keep this firmly in mind and ignore the minor variations.

The tree structures which appear in transformational literature, and which appear so formidable at first glance, can be read right off the PSG rules. Let's take a very basic example, ignoring for the moment some details which are irrelevant to the present discussion. We'll use the sentence given above as Example 11.



This structure tells us that S divides into SA, NP, and VP, in that order, and that SA is the declarative in this instance. It tells us that the first NP divides into Determiner and Noun. It tells us that the VP divides into Verb and NP, and that the NP within the VP also divides into Det and N. Finally, the words are plugged in at the bottom, with only Dec lacking a surface shape. There's nothing difficult or esoteric about this; it's merely a vertical symbolization of what we have already seen in horizontal form—if you don't believe me, turn the page sideways.

It's customary in transformational literature to indicate the presence of Q and Imp. Since everything that is not Q or Imp is going to be Declarative, there is usually no indication of that fact. You should expect, then, to see the tree written as follows:



We will follow this practice throughout our disucssion, since it is the usual one in the literature that you would be likely to read.

To summarize: A phrase structure grammar provides, for any language under analysis, information as to what elements may be used or combined to form constituents, and what their basic order must be. This information is expressed in the form of rules which are of the form X ⟶ Y, and is then reflected in tree structures. Not every transformational grammarian uses precisely the same symbols for these rules and/or trees, but all express the same information, for practical purposes.

We can now move on to . . .

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TRANSFORMATIONAL RULES

A transformational rule takes the output of a PSG rule and does things to it. For example, a sequence of language like no. 17 is the result of the application of a transformational rule to no. 18.

17. Squid I hate.
18. I hate squid.

As a native speaker of English you will be aware that there is something more basic about no. 18, which is the output of a PSG rule. No. 17 could not come from the PSG, since it is of the form NP-NP-V, but is the output of a transformational rule (T-rule). Sentences 17 and 18 are synonymous, and are said to be transformationally related.

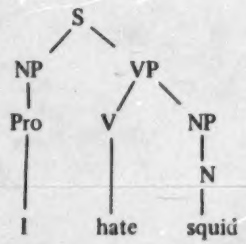
Now there's no reason why T-rules couldn't do fifty different kinds of things, logically speaking. In fact, however, there are only four possible processes which a T-rule can effect, as follows:

a. movement
b. deletion
c. insertion
d. substitution

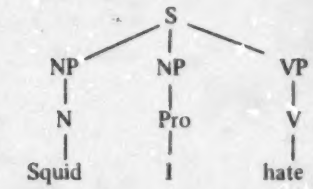
That is, a T-rule can move constituents about, delete a constituent, insert a constituent, or substitute something for a constituent. Example 17 illustrates the application of a movement rule, which has taken the constituent "squid" and moved it to the left.

If we express this information in tree structures, we will have a basic tree and a *derived* tree, a derived tree being one to which a T-rule has applied, as follows:

Basic Tree:



Derived Tree:



The constituent Pro(noun) is one of the additional possible expansions of a Noun Phrase, and we can revise the NP rule to reflect this new information, like this:

$$NP \longrightarrow \begin{Bmatrix} (Det) & N \\ Pro \end{Bmatrix}$$

An example of a deletion rule would be the rule which gets us from "I ate something" to "I ate." An example of a substitution rule would be the rule deriving "John behaved himself" from "John behaved John." And finally, it is an insertion rule which puts the word "that" at the beginning of a sentence like "That I was late offended my host." We will return to these other types of rules later and discuss them in some detail.

For the moment, however, it's necessary to take up a matter which is a source of much argument in T-grammar at present. I refer to the constraint which says that no transformational rule can be allowed to change the meaning of the sequence to which it is applied. It would be nice if this didn't have to be discussed, but it does have to be, because ignoring this controversy will make much of current transformational literature meaningless to you as reader.

There was a time, early on in T-grammar, when the proposal was that the PSG gave us a basic structure like "John is sick." Then it was proposed that there was a T-rule, called the NEGATIVE transformation, which inserted "not," to derive "John is not sick" from "John is sick." Similarly, there was a QUESTION transformation which derived "Is John sick?" from "John is sick." This early system was based primarily on the work of Harris and developed by Chomsky. However, it soon became apparent that there was no way to control such a system. That is, if I can transform "John is sick" into "John is not sick," which means something entirely different, there is no way to prevent me from transforming "John is sick" into "Mary is pedantic." It's all very well to talk about such things as changing the meaning "only a little bit," or "only to a logical degree," or something of the kind, but how is "a little bit" to be defined?

As a native speaker of English, you may have felt that the meaning of "Squid I hate" represented just precisely that little bit of difference from the meaning of "I hate squid." You may feel that the difference between "John is sick" and "Mary is pedantic" is not even in the same class. Linguists will agree with you. Formally, however, there is no way to define "a little bit" in a way

that everyone can agree upon, and so linguists have set up the constraint mentioned above, for all T-grammars: **No transformation is allowed to change meaning.**

There is a great deal of theoretical discussion of this constraint at the moment, and you should not be surprised to come across such discussion. Within the brief space of this booklet, however, we will assume that the constraint forbidding change of meaning is accepted without question.

Finally, you should know what transformational rules look like. Not because you need to be able to write one, but just so that the presence of such rules will not deter you from reading. A rule for the "I hate squid" sequence makes a good example, and will require the following terms and/or symbols:

S.D. structural description (also known in some cases as S.I., for structural index)—the basic structure

S.C. structural change, representing the derived structure after application of the rule

\# sentence boundary symbol, meaning either beginning or end of the sentence

$\Longrightarrow$ transformation arrow, as distinguished from the PSG arrow which has only one line to its shaft: $\longrightarrow$

The rule looks like this:

S.D.	#	NP	V	NP	#			$\Longrightarrow$
	1	2	3	4	5			
S.C.	#	NP		NP		V		#
	1	4		2		3	$\emptyset$	5

Or alternatively, like this:

#	NP	V	NP	#	$\Longrightarrow$
1	2	3	4	5	

1, 4, 2, 3, $\emptyset$, 5

Both rules say the same thing: if you come across a sequence that is a sentence, and which consists of an NP followed by a V followed by an NP, you may move the second NP to the left of the first NP.

You are probably wondering about the symbol "$\emptyset$." It has to be there, just as the numbers have to be there. It tells us which element has moved, and where it has been moved from, and that information is essential if the rules are to be of any use.

Other formal squiggles and symbols you may find in T-rules include the following:

X, Y, etc.	Variables. These are used to indicate that there may be something in that position in a sequence, but that it doesn't matter what it is.
where 2≠4	A conditions box. This may be found underneath a rule, and gives us some additional information; in this case it says that Element 2 must not be identical to Element 4.
i, j	Subscripts. When two instances of "John" in some sequence are marked "John$_i$" and "John$_i$," they refer to the same individual; if marked "John$_i$" and "John$_j$" they do not refer to the same individual, but to "John Smith" and "John Jones," or something of the kind.

If you read the introductions to T-grammar now available as texts, you will find that a great deal of attention is given to the writing of rules in this formal notation. For students who intend to become linguists, this is absolutely correct, although it is sometimes overdone or brought in far too soon. For non-linguists, however, the apparatus of formalisms serves only to cause the reader to shut the book and vow never to look at anything even vaguely transformational ever again. For this reason, I would like to take just a moment to discuss the problem.

People who are mathematically oriented find the reaction of those who are not, when faced with formal notation, not only inexplicable but absurd. That is their problem, and evidence of a narrowness of mind. However, when those of us who are *not* mathematically inclined allow the sight of formal notation on a page to drive us away from something that we would otherwise like to know about, we are showing an equivalent narrowness of mind. (I use this "we" not editorially, but literally, since I began to founder when I was faced with short division and everybody else always had a zero in their answers and I never did.) It is absolutely essential to suppress this kind of panic reaction and approach the formal animal as we would approach anything else about which we were curious.

Except for the mathematical linguist and the theoretical specialist, the formal notation of T-grammar is the most *trivial* part of it. This statement will bring roars of rage from some to whom the symbols are the intellectual lifeblood of linguistics; it is nonetheless true. It is perfectly possible to express every single bit of information the transformationalist has in ordinary English prose. Nothing simpler. To the inevitable question, In that case why use the notation at all? there is an excellent answer: the notation is far more convenient. The linguist can express in a half-inch of space what might take two paragraphs of type, and that is a real advantage. Those who do not want to fool with formalisms need

only convert them to the prose they prefer, and should not let them be a barrier to reading or understanding.

We can now move on to discuss some examples of major transformational rules. We will begin with . . .

Movement Rules

We have already looked at one movement rule, that which derives "Squid I hate" from "I hate squid." This rule is called TOPICALIZATION, and its function is to move an NP to the front of the sentence in order to give it greater emphasis. We call a rule like this a *focus* rule, defining the focus of a sentence as that part to which the speaker wants to give the greatest prominence. TOPICALIZATION is an optional rule; that is, nobody is required to change "I hate squid" to "Squid I hate," and the choice is a stylistic one rather than a matter of correctness.

In additional to optional rules, there are obligatory rules. rules that must be applied if the resulting sentence is to be grammatical. One such rule is the rule that derives English yes/no questions, and which has the effect of moving the first auxiliary verb to the left of the subject NP. The exact formalization of this rule is a matter of much controversy, because there are several proposals as to how the various members of the VP–such as tense, aspect, modal auxiliary, dummy auxiliary, and the like–are to be arranged. We can ignore this controversy for the moment, and state the rule as follows: **Given a sentence whose first element is Q, move the first auxiliary verb in that sentence to the left of the subject NP.**

This rule, the rule of QUESTION FORMATION, will derive all the sentences of no. 20 from those of no 19. Final sentence forms, like those in 20, are called *surface structures;* more abstract forms, like those in 19, are called *deep structures.*

19. a. # Q Mary will leave #
    b. # Q Mary will have left #
    c. # Q Evelyn is crying #
    d. # Q Bill has already eaten #

20. a. Will Mary leave?
    b. Will Mary have left?
    c. Is Evelyn crying?.
    d. Has Bill already eaten?

If you read Shakespeare you will remember that he uses questions like "Left he for London?" and "Goes thy heart with this?", which indicate that at one stage of the history of English the QUESTION FORMATION rule simply said to move the first *verb* to the left of the subject NP. This rule has changed with time, however, and now applies only to the first auxiliary verb.

Another obligatory movement rule is the NEGATIVE PLACEMENT rule, which moves NEG from its position at the beginning of the sentence (indicated

in the PSG rules) and places it immediately after the first auxiliary verb. This rule will derive no. 22 from a deep structure like no 21.

21. # NEG John will have eaten #
22. John will not have eaten.

Students almost invariably ask, very sensibly, why we don't just say in the PSG rules that NEG occurs after the first auxiliary verb. The reason is heavy theoretical going, but the necessity for it will be more clear if you consider the following sentences, all of which must be said to contain NEG in their deep structure:

23. a. Phil never eats potatoes.
    b. Marilyn refused to budge.
    c. Kevin is extremely unhappy.
    d. Nothing I do works out right.

    . . . and so on. . . .

If we had to allow for the surface position of NEG in the PSG rules, every one of these structures, and many more, would require a separate rule. To say that NEG occurs just before a sentence and is then placed by various rules, some obligatory and some optional (for example, "Never have I seen such a stubborn child," rather than "I have never seen such a stubborn child"), allows us to capture the generalization that every sentence may or may not have NEG as part of its deep structure.

It would be well for you to be aware that there are several proposals about the deep structure form of negative sequences, and that one of those proposals claims that NEG is a verb just like "walk" or "hit." There is a good deal of evidence for this idea, not the least of which is that there are many languages in which negation is a verb that takes tense markers just like any other verb.

The final movement rule to be discussed here is the rule called WH-FRONTING, which is needed for the deriving of WH-questions. (A WH-question is one that asks not for a yes or no, but for a specific item of information.) This rule takes an NP which is marked with the feature WH and moves it to the front of the sentence in which it occurs. It's a little more complex than the rules discussed above, because the surface structure of an NP with a WH-marking is not just some word plus WH, but an interrogative pronoun. Thus, "somebody-plus-WH" has the surface structure "who," "sometime-plus-WH" has the surface structure "when," "someplace-plus-WH" has the surface structure "where," "something-plus-WH" has the surface structure "what," and so on.

This is as good a time as any to point out that when we say that the deep structure of a sentence contains some word, we are only using symbols for convenience. That is, the deep structure of "boy" is not an actual word, but rather some sort of amalgamation of "a-male-human-being-between-the-ages-of-birth-and-approximately-19," which we *symbolize* as "boy." It just happens that we use the symbols "what" for "something-plus-WH" in the same way. Now, we can say that the rule of WH-FRONTING derives Example 25 from 24.

24. # will Mary eat something # ⇒
[+WH]

25. What will Mary eat?

If you look at no. 24 carefully, you will at once notice that it represents a derived structure. That is, 24 is itself derived from no. 26.

26. # Q Mary will eat something #
[+WH]

The rule of QUESTION-FORMATION must then apply to give us no. 24. It is by no means unusual for a deep structure to undergo several rules. It is in fact the *normal* case. And we call all the stages through which a deep structure goes on the way to the surface the *derivation* of that surface structure.

This causes no end of difficulty for the beginner. The best way to handle the problem is to remember that the actual pronounced form of a sequence, or the written form which represents that pronounced form, is the surface structure. *Everything* else is deep structure, and there may be many stages involved as different rules apply. The sequence of stages is the derivation.

A movement rule, then, is a rule which takes some constituent of a deep structure and moves it into a new position. Such rules may be either optional or obligatory.

Here are a few more movement rules, given simply as examples without discussion, to give you an idea of the variety of rules in English. (Some transformationalists use trees in which the verb is the first element. In this system, an additional movement rule called SUBJECT FORMATION is required, in order to move the subject NP to the left of the verb.)

27. EXTRAPOSITION
That John is absent is disgraceful. ⇒
It is disgraceful that John is absent.

28. PASSIVE
John hit the ball. ⇒
The ball was hit by John.

29. ADJECTIVE PREPOSING
the boy who is tall . . . ⇒
the tall boy . . .

30. CLEFT
We ate the fish with a fork.
It was with a fork that we ate the fish.

31. SUBJECT-RAISING
It is difficult to please John. ⇒
John is difficult to please.

Now we can go on to discuss . . .

Insertion Rules

If no transformational rule can be allowed to change meaning, then the only sort of element that can be inserted by a T-rule is a meaningless one. This is somewhat difficult to understand, since you probably have a strong feeling that there *are* no meaningless words. However, if you stop to think about it, can you provide a meaning for the italicized words below?

32. a. *That* May smokes is obvious.
    b. I want *to* leave at once.
    c. *Did* you pick up the groceries?

In Example 32a, there are two verbs present. One of them is the verb "smokes," with "May" as its subject, and "May smokes" is a sentence. The other verb phrase "is obvious" has as its subject the entire sentence "May smokes." The meaning of the sentence as a whole is the sum of "May smokes" and "is obvious," but "May smokes is obvious" is not a grammatical sentence of English. To make it grammatical, the work "that" must be inserted, and the rule in question is called THAT-INSERTION. "That" has no meaning of its own at all; it is simply there to indicate that "May smokes" is not the *whole* sentence, but rather what is called an *embedded* sentence, a sentence serving as a part of another sentence. An embedded sentence is another of the possible choices for NP.

The meaninglessness of "to" is easier to grasp. "To" is only present to indicate that the subject of a particular verb is missing, for one reason or another, and that the rule of TO-INSERTION has applied. It has no independent meaning.

And finally, there is the "did" of "Did you pick up the groceries?" You will remember that the rule of QUESTION FORMATION, like the rule of NEGATIVE PLACEMENT, requires that something be done *with reference to the first auxiliary verb.* This allowed us to derive the sentences of Example 34 from the deep structures of 33.

33. a. # Q John will leave #
    b. # NEG John will leave #

34. a. Will John leave?
    b. John will not leave.

But what about a deep structure like Example 35?

35. a. # Q John leave #

(We will ignore for the moment the way in which the information that the verb "leave" is past tense in represented in the deep structure.)

Clearly, the rules of QUESTION FORMATION cannot apply here, because there is no auxiliary present. And there would be the same problem if we tried to apply NEGATIVE PLACEMENT to a deep structure like Example 36.

36. # NEG John leave #

In such instances, when there is no auxiliary verb present in the deep structure, the neutral (or dummy) auxiliary "do" is inserted by the rule of DO-INSERTION, as follows:

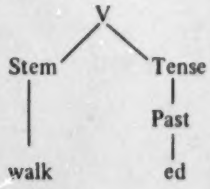
37. # Q John leave # ⇒
    # Q John did leave # ⇒
    Did John leave?

38. # NEG John leave # ⇒
    # NEG John did leave # ⇒
    John did not leave.

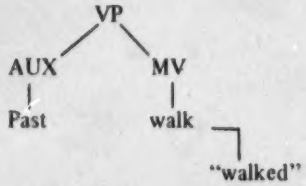
The effect of the rule of DO-INSERTION is to insert an auxiliary when one is required for NEG and Q sentences. This "do" has no meaning of its own, and should not be confused with the "do" of "I did my homework," which does have a meaning.

We have been avoiding the question of the way in which a verb is marked for tense in the deep structure, and might just as well deal with it here. There are a number of possibilities, among them the following:

a.



b.



AUX=Auxiliary
MV=Main Verb

c.

[+PAST]

(The feature notation in alternative c is like the use of the feature [+WH] to indicate that an NP is the requested item in a WH-question.)

You will also find tree diagrams in which the items PAST, PROGRESSIVE, and the like appear as predicates.

All these possibilities, and others that have been proposed, are said to be "formally equivalent." That is, they all mean that if the surface structure of a verb will require a past-tense marker, whether it is the "ed" of the regular past or the vowel change of verbs like "sing," there must be some indication in the deep structure that the act described took place in the past.

When an auxiliary verb is present, that verb will bear the tense-marking; if no auxiliary is present, the main verb will be marked, giving us this pattern:

a. He did leave.
*b. He do left.
c. Did she jump?
*d. Do she jumped?

As a native speaker of English, you know that there are times when an auxiliary *and* a main verb shown tense-marking. This occurs when there is marking for both tense and aspect, as in the following:

a.	He had left.	(past tense, perfect aspect)
b.	He is singing.	(present tense, progressive aspect)
c.	He was singing.	(past tense, progressive aspect)

This is not the place to go into a discussion of the vagaries of English tense and aspect. I tell you frankly that they are a topic of a messiness that is almost awe-inspiring. It is clear, and a commonplace of T-grammar literature, that the English "present" tense has little if anything to do with present time, and should be correctly called "non-past" tense, as witnessed by sentences like "He runs tomorrow at dawn" and "I run every afternoon at six." It is also clear that the subtleties of combinations such as "He would have been working here three years tomorrow" are not easily explained with any kind of clarity. For our purposes, it is sufficient to remember that in every English sentence there must be *some* element that bears tense-marking, that the tense must be indicated in the deep structure, and that if only a main verb is present in the surface structure it will be marked for tense, while if an auxiliary is present, the main verb may or may not turn up on the surface with a tense marker. Depending!

To return to the topic of insertion rules, we can summarize by saying the following: an insertion rule is a rule that inserts a meaningless element into a deep structure. Insertion rules are ordinarily obligatory rules.

The next topic for discussion is that of . . .

Substitution Rules

Since no T-rule is allowed to change meaning, it's clear that substitution rules can only replace an element with one having an identical meaning. This means that substitution rules are pronominalization rules, since only pronouns can meet this criterion. (That is, you cannot use a substitution rule to substitute

"unmarried man" for "bachelor." The meanings are very close, but not identical.)

Pronominalization can best be described as a feature-matching operation, which substitutes one of a set of forms called pronouns for NP's with identical features. So, if you have two instances of "John" in a sentence, you may substitute "he" for one of them because both "John" and "he" have the following features:

$$\begin{bmatrix} +\text{MASCULINE} \\ +\text{SINGULAR} \\ +\text{HUMAN} \\ +\text{SUBJECT} \end{bmatrix}$$

This process will derive Example 40 from 39.

39. # John$_i$ said that John$_i$ was sick # $\Rightarrow$
40. John said that he was sick.

If you would like to point out that the subscripts (the little "i" markings) are not necessary, since "John said that he was sick" can also refer to John's mentioning the sickness of some other male individual, your reaction is understandable. However, if we look at this rule of PRONOMINALIZATION a bit more closely, you will see that there is a reason for the subscripts.

This rule operates in English under strict constraints, some of which are beyond the scope of this brief discussion. From a practical point of view, the rules must operate from left to right, so that the derivation shown in Example 41 is allowed, but that in 42 is forbidden.

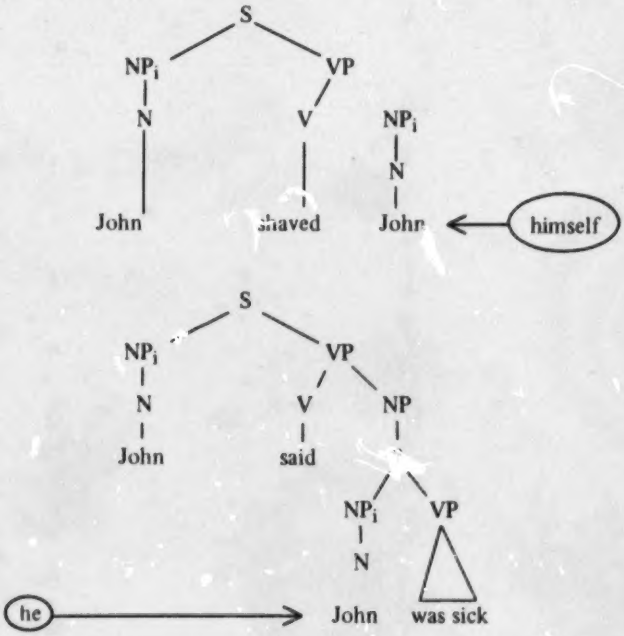
41. a. # Mary$_i$ reported that Mary$_i$ had lost the ball # $\Rightarrow$
    b. Mary reported that she had lost the ball.
42. a. # Mary$_i$ reported that Mary$_i$ had lost the ball # $\Rightarrow$
    b. * She reported that Mary had lost the ball.

It's true that sentence 42b is grammatical, in the sense that grammatical sentences with that surface shape exist. But that sentence *cannot* be derived from 42a. That is, in the sentence "She said that Mary was sick" the words "she" and "Mary" have to refer to different individuals. In "Mary said that she was sick," on the other hand, "Mary" and "she" *may* be the same individual, although they do not have to be.

Some substitution rules are special cases of the pronominalization process. There is the REFLEXIVE rule, which applies to give the following derivation:

43. a. # John$_i$ shaved John$_i$ # $\Rightarrow$
    b. John shaved himself.

This rule applies only when the two identical NP's (known as *coreferential* NP's) are within the same sentence and are subjects and objects of the same verb. This is an obligatory rule, since no native speaker of English will accept a sentence where it has not applied. In sentences 40 and 41, however, the rule applied across the boundaries of the sentence. To make this clear, we can compare the tree structure for no. 43 with that for nos. 39-40, like this:



Another substitution rule is the rule of DO-SO PRONOMINALIZATION, which derives Example 45 from 44.

44. # John picked up the ball and Mary picked up the ball, too #

45. John picked up the ball and Mary did so, too.

One of the topics you will find much discussed in T-grammar literature is the order in which various rules must be applied. There's no logical reason why there should have to be any order at all, but as it turns out, there are certain rule orderings that can be proved for English. For example, look at no. 46:

46. Near them the tourists noticed a chipmunk.

It is possible for "them" and "the tourists" to refer to the same individuals, and yet it looks as if the rule has applied from right to left in this sentence, which we know is not allowed for English. This is easily explained if we know that the rule of PRONOMINALIZATION has applied before the movement rule that put "near them" at the beginning of the sentence. Here's the derivation:

the tourists$_i$ noticed a chipmunk near the tourists$_i$ # $\Rightarrow$

the tourists$_i$ noticed a chipmunk near them$_i$ # $\Rightarrow$

Near them the tourists noticed a chipmunk.

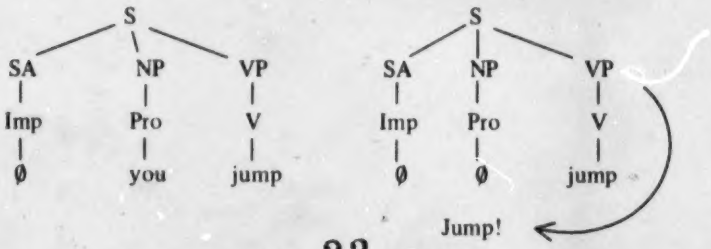
Now we can move on to . . .

Deletion Rules

For many linguists, deletion rules are the most interesting of the four kinds, because of the theoretical problems that they pose. Remember that no T-rule can change meaning. This means that if something is deleted from a sequence it always has to be possible to tell what that something was—that is, all deletion must be *recoverable*. Now it's obvious that some constraint must be placed on a grammar to meet this condition. Clearly a rule that just said "delete every fifth constituent" would not insure recoverable deletion, since there'd be no way to tell what element was gone.

All known human languages solve this problem by allowing only two kinds of deletion, and no other kind. The first kind is called *constant deletion*, using the term "constant" with its mathematical sense of "element that does not change." In constant deletion the constituent to be deleted is actually mentioned in the rule. For example, the rule of IMPERATIVE DELETION is a constant deletion rule, and it goes like this: **Given a sentence whose first element is IMP(erative), followed by the word "you" and a VP, you may delete the word "you."**

Here are the tree structures for this rule:



The second kind of deletion is called *identity deletion.* In this type of deletion, recoverability is insured by the condition that the surface structure must contain an element identical to the element deleted from the deep structure.

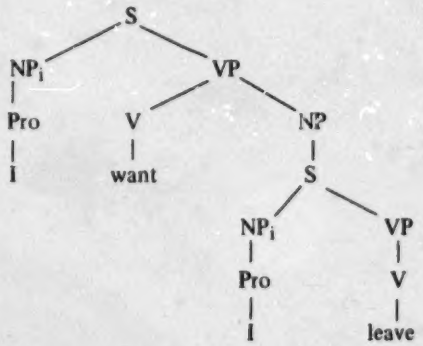
For example, there is the rule of VP-DELETION, which will apply to derive sentence 47 from 46.

46. # if Mary says she will swim the lake, she will swim the lake # ⟹

47. If Mary says she will swim the lake, she will.

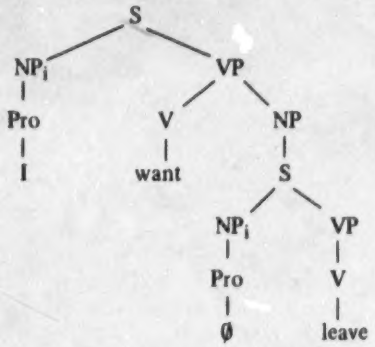
Every native speaker of English knows that the sentence "If Mary says she will swim the lake, she will" can *only* mean "If Mary says she will swim the lake, she will swim the lake," and thus the deletion is completely recoverable. This rule could not apply to a structure like "If Mary says she will swim the lake, she will drive to Los Angeles instead," because deletion of "drive to Los Angeles instead" would immediately change the meaning. A native speaker of English would not interpret "If Mary says she will swim the lake, she will" to mean "If Mary says she will swim the lake, she will drive to Los Angeles instead," not under any circumstances whatsoever.

A second example of identity deletion is the rule called EQUI-NP DELETION ("equi" meaning "equivalent"). This rule will be more easily understood if tree structures are used to explain it. Here is the deep structure tree:



Given a deep structure like this, the rule of EQUI-NP DELETION will delete the second instance of "I." (You may have noticed by now that English grammar seems to have a strong objection to repetition of coreferential NP's in a single sentence, and that many rules have the effect of either deleting or pronominalizing the second of any such pair. Linguists call this sort of thing, where a number of rules appear to be working together for a single result, a *conspiracy.*)

In the next stage of the derivation, the tree will look like this:



Then, since the sequence "I want leave" is not grammatical in English, the rule of TO-INSERTION will apply to give us the final surface structure, "I want to leave." It should be clear that if the second NP, the one in the embedded sentence, is not the same as the first one, the rule will not apply.

Now we have covered the PSG, which gives us our basic structures, and the four types of transformational rules, which give us our surface structures. We can now turn to the next topic, which is . . .

SO WHAT?

You are entitled to this question. You have probably had years of grammar instruction, you may well know how to diagram a sentence, you have mastered a system that seems to you to be adequate. Your reaction to this description of T-grammar is likely to be "So what?" and that is understandable. Setting aside for the moment the undeniable fact that much contemporary grammar discussion is inaccessible to you if you don't learn about T-grammar (which may strike you as nothing more than esoteric perversity on the part of the writers), is there any reason for you to care about this new grammar system?

I think there is. I think that transformational grammar has proved its worth. I don't expect to convert you here, because I haven't the time or space, but I would like to give you just an example or two to bear out my contention.

The only reason to replace one system with another is that the new system does something the old system cannot do. What we need is to show that T-grammar has this advantage over traditional grammar.

First of all, ask yourself what your answer to a question like "How do you form a yes/no question in English?" would have been prior to reading this booklet. Unless you're very unusual, you would have said this: "To form a yes/no question in English, you go. . . ." And after "go" there would have been a yes/no question. This is all very well, and demonstrates that you are able to *produce* an English yes/no question, but in no way does it explain how it is done. T-grammar puts you, as a native speaker of English, in touch with knowledge which has always been in your head, but which has been effectively beyond the reach of your conscious thought.

Secondly, look at the following sentence:

48. Even John could get an A in this class.

As a native speaker of English, you are aware that this sentence *means* two other sentences:

49. a. John is not very smart.
    b. This class is not very difficult.

If you compare no. 48 with 50:

50. John could get an A in this class.

You will see at once that removing "even" from the sentence also removes the two sentences of no. 49. T-grammar gives us a way of talking about this phenomenon, referring to the sentences of Example 49 as *presuppositions* of 48, and as part of the deep structure of 48. But if you go to a standard dictionary of

English, which is based on traditional grammar, and look up the word "even," you will not find this information anywhere.

Finally, consider the following classic pair of sentences, first pointed out by Chomsky, and consider how they would be diagrammed in traditional grammar.

51. a. John is easy to please.
    b. John is eager to please.

You will realize at one that the diagrams for these two sentences would be absolutely identical except for the spellings of "easy" and "eager," thus implying that the sentences are syntactically identical. But is this true? What do the sentences really mean?

T-grammar would tell you that the deep structure of sentence 51a was "For somebody to please John is easy," and that the rule of INDEFINITE DELETION has removed the "somebody" while movement rules have produced the final ordering. It would tell you that the deep structure of no. 51b is "John is eager to please somebody," and that in this case also, INDEFINITE DELETION has removed the "somebody." The tree structures that can be drawn to illustrate these processes make it unambiguously clear that in 51b John is the logical subject of both "eager" and "please," while in 51a he is the logical subject of neither one. This is an important difference, and traditional diagramming gives us no way to express it.

A similar problem arises with a pair of sentences like those in Example 52:

52. a. John promised Mary to leave.
    b. John persuaded Mary to leave.

In 52a, it is John who is to leave, while in 52b it is Mary. This is a major difference, and a grammar must allow us to express this difference, but traditional diagrams would not allow that expression.

When something like this goes on too long, it is called (by linguists and everybody else) a *polemic*. I will therefore stop and take up my last topic, which is . . .

PHONOLOGY

I am going to discuss only briefly the application of T-grammar to the sound system, which is called *phonology*. The principles are the same, the terminology is often the same, and even the formal notation differs very little. In phonology as in syntax, sequences have a deep structure and a surface structure, and the stages between are called a derivation. In phonology as in syntax, there are rewriting rules (like the PSG rules) and there are transformational rules, and those T-rules are of only four kinds. In both areas of grammar, feature notation is used to express various kinds of information.

Let's look at an example or two of the kind of thing transformational phonologists do. Here is a set of forms from English:

sign	signature
malign	malignant
benign	benignant
resign	resignation

All of the left-hand forms have a "silent" segment, the "g," which is not silent in the forms on the right. The phonologist can demonstrate that there is a rule of English forbidding any English word to end in a *pronounced* sequence of "g" followed by "n." Further, he or she can demonstrate that there is a deletion rule which removes the "g" in such a case. The derivation would show that "g" is present in the deep structure of the word "sign," but absent in the surface structure. Thus, there is nothing in any way irregular about the pronunciation of "sign" or any of the other words in the left column; they are perfectly regular.

A second example is the formation of the English plural ending for all regular plurals. Traditionally we are told that the plural ending has three possible forms—"s, z, and ez." This will cover "books," which ends with a pronounced "s," "bags," which ends with a pronounced "z," and "beaches," which ends with a pronounced "ez." This is correct, but unexplained.

The T-phonologist will tell you that several rules of English are involved in this system. One is a rule that says that whenever a plural marker is put on a noun, it must agree in *voicing* with the last sound in that noun. (English sounds are all marked plus or minus voice, and a voiced sound is one that requires the vibration of the vocal cords for its production.) This means that when you pluralize "book," which ends in a voiceless "k," the plural marker is the voiceless "s." The "g" of "bag," however, is voiced, and requires that the "s" also become voiced, which makes it a "z."

The second rule is one which says that in English there can never be a pronounced sequence of two of these consonants: s, z, sh, ch, zh, j. (If you want to test this, try to pronounce a hypothetical candy bar with a name like "Shchokolat.") This rule requires not deletion of one of the two consonants, but

rather insertion of a vowel to break up the forbidden sequence. Since adding the plural ending to a word like "beach" would require a sequence of "ch" followed by "s," a vowel is inserted, giving us "beaches."

Other rules are involved in the derivation of these three forms, but they are not relevant to our discussion at this point. For our purposes, the derivations of the three forms are like this:

"books"

#buk - [+PLURAL] #	Deep structure
#buk+s #	Add the plural ending.
books	Surface structure

"bags"

#bag - [+PLURAL] #	Deep structure
#bag+s#	Add the plural ending.
#bag+z#	Apply the voicing rule.
bags	Surface structure

"beaches"

#biych - [+PLURAL] #	Deep structure
#biych+s#	Add the plural ending.
#biych+e+s#	Apply the vowel insertion rule.
#biych+e+z#	Apply the voicing rule.
beaches	Surface structure

In phonology, as in syntax, there can be no rule that would change the deep structure of "books" into a surface structure like "elephants," because no rule is allowed to change the meaning.

That's it. I hope it helps.

A BRIEF BIBLIOGRAPHY

Elgin, Suzette Haden. *What Is Linguistics?* Englewood Cliffs, N.J., Prentice-Hall, Inc., 1973.

This is the simplest text available on transformational grammar, so far as I know. It is devoted entirely to explaining terminology and basic concepts in a way that demands no previous preparation from the reader. There is an accompanying workbook available to teachers on request.

Jacobs, Roderick, editor. *Studies in Language: Introductory Readings in Transformational Linguistics.* Lexington, Mass.: Xerox College Publishing, 1973.

A collection of short readings in transformational grammar by a number of writers. The articles are simple and suitable for the beginner. A variety of topics are covered, among them, "Linguistic Universals and Their Relevance to TESOL," "The Vowel Shift and English Orthography," and "Dialect Differences and Syntax." I particularly recommend the article "Linguistic Semantics Today," by Paul Chapin, as a lucid and readable introduction to the problem of semantics in transformational grammar.

Jacobs, Roderick, and Peter S. Rosenbaum. *Transformations, Style, and Meaning.* Lexington, Mass.: Xerox College Publishing, 1971.

An elementary introduction to transformational syntax. The level of difficulty is sometimes uneven in this text, and some sections may be hard for the beginner to follow, but taken as a whole it is a useful introduction.

Langacker, Ronald W. *Language and Its Structure.* New York: Harcourt Brace Jovanovich, 1973.

This book will introduce you to some basic ideas of transformational linguistics, not only with regard to syntax and phonology but in other areas of linguistics as well. There is probably no one writing in linguistics today who is able to combine clarity and thoroughness as well as Langacker. I recommend the book highly.

Liles, Bruce. *Introduction to Linguistics.* Englewood Cliffs, N.J., Prentice-Hall, Inc., 1975.

This is a book to read *after* you have read all the others. It is an excellent beginning text, dealing primarily with the syntax of English, but the level of difficulty is somewhat higher than that of the four books listed above. It should act as a satisfactory bridge between elementary books and more advanced ones, and has the added advantage of being very readable.